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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

REC'D 20 AUG 2002 WIPO PCT

Applicant's or agent's file reference P446997 CJE/vjt	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/NZ01/00188	International Filing Date *(day/month/year)* 11 September 2001	Priority Date *(day/month/year)* 11 September 2000
International Patent Classification (IPC) or national classification and IPC **Int. Cl.** [7] A23J 3/34		
Applicant NEW ZEALAND DAIRY BOARD et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   [X] This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of **2** sheet(s).

3. This report contains indications relating to the following items:

I	[X]	Basis of the report
II	[ ]	Priority
III	[ ]	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	[ ]	Lack of unity of invention
V	[X]	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	[ ]	Certain documents cited
VII	[ ]	Certain defects in the international application
VIII	[ ]	Certain observations on the international application

Date of submission of the demand	Date of completion of the report
10 April 2002	9 August 2002
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **MADHU K. JOGIA** Telephone No. (02) 6283 2512

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/NZ01/00188

I. Basis of the report

1. With regard to the **elements** of the international application:*

- [ ] the international application as originally filed.
- [X] the description, pages **1-23; 28-34** , as originally filed,
  pages , filed with the demand,
  pages , received on with the letter of
- [X] the claims, pages **24, 26,** , as originally filed,
  pages , as amended (together with any statement) under Article 19,
  pages , filed with the demand,
  pages **25, 27** , received on **31 July 2002** with the letter of **31 July 2002**
- [X] the drawings, pages **1-2** , as originally filed,
  pages , filed with the demand,
  pages , received on with the letter of
- [X] the sequence listing part of the description:
  pages **22-23** , as originally filed
  pages , filed with the demand
  pages , received on with the letter of

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

- [ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- [ ] the language of publication of the international application (under Rule 48.3(b)).
- [ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- [X] contained in the international application in written form.
- [ ] filed together with the international application in computer readable form.
- [ ] furnished subsequently to this Authority in written form.
- [ ] furnished subsequently to this Authority in computer readable form.
- [ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- [X] The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. [ ] The amendments have resulted in the cancellation of:
   - [ ] the description, pages
   - [ ] the claims, Nos.
   - [ ] the drawings, sheets/fig.

5. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims **1-34**	**YES**
	Claims	**NO**
Inventive step (IS)	Claims **1-34**	**YES**
	Claims	**NO**
Industrial applicability (IA)	Claims **1-34**	**YES**
	Claims	**NO**

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

D1 WO 9965326
D2 EP 269593
D3 WO 9221248
D4 WO 9324020
D5 US 5952193
D6 WO 9304593
D7 WO 9113554
D8 JP 10033115
D9 Int Dairy J 6, pp 285-94 (1996) Castro et al

Novelty (N) and Inventive Step Claims 1-34

The present invention relates to a process of preparing a whey protein hydrolysate from a whey protein isolate (WPI) substrate having improved flavour and ACE-I inhibiting properties.

The closest prior art is D1 (WO 9965326) as acknowledged in the present application. This document discloses process for preparing whey protein hydrolysate containing bioactive peptides. The process and properties desired of the products are the same as those defined in the present invention. However, the products per se are distinguished from the prior art by the use of whey protein isolate (WPI) in the process and not whey protein hydrolysate. The Examples of the prior art and the present invention are clearly different by way of the use of different substrates. Further, documents D2-D9 do not teach the use of WPI according to the present invention.

Therefore the invention appears to be novel and inventive in the light of the above prior art documents.

Industrial applicability (IA) Claims 1-34

The claims appear to possess industrial applicability.

7. A process as claimed in claim 1 or claim 2, wherein said enzyme deactivating step comprises altering the pH of said whey protein-containing substrate to a pH at which said protease is not active.

8. A process as claimed in claim 7, wherein said enzyme deactivating step includes heat deactivation as claimed in any one of claims 3 to 6.

9. A process as claimed in claim 1 or claim 2, wherein said enzyme deactivating step iv) comprises subjecting said hydrolysate to ultrafiltration with an ultrafiltration membrane having a nominal molecular weight cutoff in the range of about 10-500 kDa.

10. A process as claimed in claim 9, wherein said ultrafiltration membrane has a nominal molecular weight cut off in the range of about 10-200 kDa.

11. A process as claimed in any one of the preceding claims, wherein said enzyme is immobilised on an inert support during said hydrolysis step ii).

12. A process as claimed in claim 11, wherein said inert support is Roehm Eupergit, carrageenan particles, chitosan particles or any other suitable inert support material.

13. A process as claimed in any one of the preceding claims, wherein the degree of hydrolysis is from about 3% to about 10%.

14. A process as claimed in claim 13, wherein the degree of hydrolysis is from about 3% to about 5%.

15. A process as claimed in any one of the preceding claims, wherein the whey protein hydrolysate so produced comprises one or more bioactive peptides selected from the group consisting of SAP (SEQ ID NO: 1), VSLPEW (SEQ ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).

16. A process as claimed in any one of the preceding claims, wherein the whey protein hydrolysate so prepared comprises at least one bioactive peptide selected from the group consisting of LIVTQ (SEQ ID NO: 1), MKG (SEQ ID NO: 2) and ALPMH (SEQ ID NO: 3), in combination with at least one bioactive peptide selected from the group comprising SAP (SEQ ID NO: 4), VSLPEW (SEQ ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).

ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).

28. A product as claimed in any one of claims 22 to 26, comprising at least one bioactive peptide selected from the group consisting of LIVTQ (SEQ ID NO: 1), MKG (SEQ ID NO: 2) and ALPMH (SEQ ID NO: 3), in combination with at least one bioactive peptide selected from the group comprising SAP (SEQ ID NO: 4), VSLPEW (SEQ ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).

29. A food product containing a WPI hydrolysate product as claimed in any one of claims 22 to 28.

30. A method of reducing systolic blood pressure in a subject comprising administering an effective amount of a WPI hydrolysate as claimed in any one of claims 22 to 28 or food product containing said hydrolysate as claimed in claim 29 to a patient in need thereof.

31. A use of a product as claimed in any one of claims 22 to 28 in the manufacture of a medicament for treating or preventing hypertension in a patient in need thereof.

32. A pharmaceutical composition comprising the product of any one of claims 22 to 28 together with a pharmaceutically acceptable carrier.

33. Any one or any combination of two or more peptides selected from the group comprising SAP (SEQ ID NO: 1),
VSLPEW (SEQ ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).

34. Any one bioactive peptide selected from the group consisting of LIVTQ (SEQ ID NO: 1), MKG (SEQ ID NO: 2) and ALPMH (SEQ ID NO: 3), in combination with at least one bioactive peptide selected from the group comprising SAP (SEQ ID NO: 4), VSLPEW (SEQ ID NO: 5), INYWL (SEQ ID NO: 6), LKPTPEGDLEIL (SEQ ID NO: 7) and LKGYGGVSLPEW (SEQ ID NO: 8).